4-BUTTON MANUAL / AUTOMATIC
TRANSMISSION REMOTE STARTER
WITH **VIRTUAL TACH SYSTEM**
(AS PRG-1000 COMPATIBLE)

CT-3371

Installation Guide

Notice

The manufacturer will accept no responsibility for any electrical damage resulting from improper installation of the product, be that either damage to the vehicle itself or to the unit. This unit must be installed by certified technician using all safety devices supplied. Please note that this guide has been written for properly trained technicians: a certain level of skills and knowledge is therefore assumed. Please review the Installation Guide carefully before beginning any work.

Warning

Before installing the unit, if installing on a vehicle with a manual transmission, test that the OEM Door Switch contacts of the vehicle work well, and that the Parking Brake system operates properly. If installing on a vehicle with an automatic transmission, test that the vehicle does not start when the gearshift lever is in the "Drive" position. If it starts in gear, install a manual transmission remote starter system instead.

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Introduction

This is a state-of-the-art remote car starter system. The system is packed with advanced features such as priority access to the driver's door (commodity features) and the Safe Start children safety feature.
With many advanced functions, this product will satisfy any one of your expectations from high-end commodity and security systems, without neglecting any standard feature commonly offered by entry-level starters.

Included in the Package

Please review the Installation Guide before beginning the installation, particularly the Wiring Schematic and the Programming Options.
It is very important that you familiarize yourself with the programming and the operation of the system, even if you have already installed a similar system in the past. There are many great features that may be overlooked if the manual is not read; this would prevent you from maximizing the potential of the Module.
Prior to the installation, make sure that all the hardware components required to install the system are in the box.

The following is a list of components included in the kit:

1- Control unit
1- Four button remote
1- Antenna interconnect cable
1- Harness kit
1- Antenna
1- Parts bag
1- Installation guide
1- User guide
1- Wiring diagram

Installation Tools

Here is a list of basic tools and supplies you will need to test and install safely.

- Digital Multi Meter (DMM), Computer safe logic probe, Fused jumper wire, Neon 'trouble' light that is carpet safe, Fender protector, Carpet protector
- Soldering Iron, solder, electrical tape, wire tie straps, split loom, diodes, resistors, relays
- Wire cutters, Wire strippers, Wire crimpers, Needle Nose Pliers
- Sharp knife, Panel poppers, Various Screw drivers
- Socket set, Wrench set, Drill with Drill Bits, Coat hanger (for fishing wires through the fire wall)

Installation Points to Remember

- On vehicles with a manual transmission, always ensure that all door pins are monitored by the remote starter.
- Make sure that the Parking brake and Door switch contacts work properly.
- When working on a vehicle, always leave a window open.
- Never leave the keys in the car. Leave them on a workbench with a window rolled down.
- If possible, remove courtesy light fuse to prevent battery drain.
- The Programming Assistance Button (a.k.a. PAB): The PAB is mounted on the side of the unit. This push button mimics the hood-pin switch in order to avoid having to get out of the vehicle and pressing the hood-pin switch. The PAB will work only when the hood is up.
- Inspect vehicle for any body damage or electrical problems.
- Always solder and tape all connections.
- Keep the transceiver away from other types of antennas (GPS/OnStar®).
- Never install the control unit where it could interfere with normal operation or obstruct service technicians.
- Always use a grommet when running wires into the engine compartment.
- Never run wires through bare or sharp metal.
- Do not disconnect the battery on vehicles equipped with air bags and anti-theft radios.
- Never ground the control unit to the steering column.
- Make sure that all electrical switches and controls operate properly.
- Verify that the vehicle starts and idles properly.
- Make sure that all safety equipment is installed: the valet button (if installed), the hood switch, and the warning label.
  Examples:
  Wiring a clutch bypass and a transponder module to the ground out when running wire: At the junction point, where Ground Out when running "splits" and goes to each device, a diode is inserted on each of those lines.
  Multiple or separate door pin connections:
  When joining all door pins together to the door pin input wire of the module, each wire must be isolated with a diode to prevent feedback.
  N.B.: The above examples reflect common situations where diodes are used to isolate. Please note that there are numerous other scenarios where diode isolation is required.
  Always make sure that any external relays or modules added to the Remote Starter module are properly fused and diode isolated.
- Vehicles equipped with daytime running lights may not allow the installer to view certain programming results since the daytime running lights do not turn OFF with the IGN off (Note: The Parking Light output relay in the module gives two "*clicks"* per flash, 1 "click" for ON and 1 "click" for OFF).
- Parking Light flashes referred to in this manual refer to the Parking Light output of the module.

INDUSTRY CANADA USER NOTICE:
Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.
To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (EIRP) is not more than that required for successful communication.
NOTE: The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. Such modifications could void the user's authority to operate the equipment.

Installation Order

The following is a suggested order for the Installation procedure. It is intended as a guide for novices, to help make the process of installing a remote starter module easier. Time is wasted by rewiring the module when mistakes are made. Also, the neatness of the installation is lessened every time the module is taken down and the wiring is "corrected".

♦ Visit www.Prostart.org to obtain a copy of your vehicle's tech sheet. (wire colors and locations)

♦ Before you get started, make sure the vehicle starts and idles properly with the Ignition key, and that the electrical system is not compromised in any way.

♦ After deciding what options are to be added to the basic installation, you can start by looking for the wires that will be needed.

♦ Remember to be careful when removing the panels that are covering the wires you are searching for.

♦ Once all of the wires have been found, they should be tested to verify that they are the correct ones needed for the installation.

♦ When all the wires have been tested and found, they can be stripped to expose the wire (over one inch of insulation should be removed).

♦ It is always better to strip more than you need. A common way cold solder joints happen is when not enough insulation is stripped off the vehicle's wire, so during the soldering process the insulation from the wire melts and flows into the connection instead of the solder.

♦ Decide where the module is going to be mounted. It is ALWAYS mounted inside the passenger compartment, and NEVER in the engine bay. Under the driver's side of the dash there is usually enough room for the module to fit. Once the location has been decided, proceed to the next step.

♦ Mount the antenna and run the cable to the location where the module is going to be mounted. The antenna will get the best range when it is high up in the vehicle, and not obstructed by metal. The most common choice is the center of the windshield at the top, behind the rear view mirror, and at least one inch below the tint strip. Another location should be used if there is another antenna in this location, compass, or other device that may interfere with the range of the start module.

♦ In the engine compartment, mount the hood pin, in a suitable location. Search along the firewall for an OEM grommet you run the wires through. If you cannot find an OEM grommet to use, you will have to drill a hole. The hole must be big enough for all of your wires to fit through. To be safe drill the hole out a little bigger so the wires will have ample room. We recommend using an aftermarket grommet whenever you drill a hole through the firewall. This will protect the wires from rubbing against the bare metal and possibly shorting out. The next step is to pre-wire the module. This is done on your work bench, and not in the vehicle. Connect any external modules and relays that may be needed for you install. Tape or tie-strap wires that are going to be routed to the same areas of the vehicle. This will keep things neat when the module is in the vehicle. The fuses on the power wires should be removed during the pre-wire stage. The fuses will not be put back in until the powering stage of the installation.

♦ Connect all the necessary accessories to the module before mounting it in the vehicle. Use tie-straps to secure it to the vehicle. Make sure the module and harnessing do not interfere with any moving parts, and do not obstruct access to diagnostic ports, or fuse boxes. It should be up in the dash, high enough that it won't get kicked by accident.

♦ Once the module is secured, route the wires to the previously stripped wires they correspond to (leave the engine compartment wires for last). Tie strap them up as you go, so they do not interfere with anything else.

♦ When all of the passenger compartment wires are ran to their locations, you can route the engine compartment wires through the firewall.

♦ With the engine compartment wires out the way, you can begin making the connections in the passenger compartment. Strip about an inch of wire past where the connection is going to be made. This extra bit of wire is wrapped around the exposed OEM wire to secure in place while you are soldering.

♦ When all of the wires have been connected, solder the connections. When the solder has cooled, the connections are then individually taped up, to isolate them.

♦ Return to the engine bay and route the tach and hood pin wire to their corresponding connections.

♦ Solder the engine compartment wire once the connections are made. When the solder has cooled, the connections are then individually taped up, to isolate them.

♦ Use your DMM to verify that your ground location is good before grounding the module.

♦ The last step before programming is to power up the module. Replace the power fuses on the power wire fuse holders. The module will flash the Park lights twice to confirm the power-up.

A basic introduction to the Relay

What is a relay?

A relay is a switching device that responds to a small current or voltage change by activating switches or other devices in an electric circuit such as an electromagnetic switch, remote controlled switch, a switching device.

Why are relays used?

Relays can have several purposes in remote car starter installations. They are mainly used for isolation, inversion, interruption, strengthening current, and for powering multiple wires from one source safely.

How does a relay work?

The basic relay consists of a coil and a set of contacts. The most common relay mechanism is the electromagnetic mechanism. When voltage is applied to the coil, current passes through the wire and creates a magnetic field. This magnetic field pulls the contacts together and holds them until the current flow in the coil has stopped.
Relays come in all varieties and types, but for the applications that concern us, we will concentrate on the single pole double throw (SPDT) 12 volts relay.

Naming Convention

Usually the relay's manufacturer will include an electrical diagram on the relay displaying the role of each terminal and how they interact with each other.
These terminal numbers are standard, and can be used with any SPDT relay.
85 & 86: The coil. These inputs energize the coil when one is +12 volts, and the other is negative. They are usually non-polarized, so it does not matter which one is positive (+) or negative (-).
87: Normally Open (N/O). When the coil is energized, 87 is connected to 30.
87A: Normally Closed (N/C). When the coil is at rest, 87A is connected to 30.
30: Common. When the relay is at rest, 30 is connected to 87A, when the coil is energized, it is then moved and makes contact with 87. (Note: in a SPDT relay, 30 can never be connected to 87 and 87A at the same time, 30 is connected to either 87 or 87A)

What happens

When there is no voltage across the coil (terminals 85 and 86), the relay's movable contact arm (connected to terminal 30) is held, by spring tension, against terminal 87A (normally closed circuit).
When 12 volts is applied to the coil (terminals 85 and 86), the arm (connected to terminal 30) is pulled by the electromagnet (coil) so that it physically connects to terminal 87 (normally open circuit).
When 12 volts is applied to the coil (terminals 85 and 86), the arm (connected to terminal 30) is pulled by the electromagnet (coil) so that it physically connects to terminal 87 (normally open circuit).
Remember, there is no polarity on a relay's coil. This means that you may apply positive from the battery to either terminal 85 or 86, and then ground the other terminal to activate the relay. In other words, you may use either a positive or negative trigger to energize the relay.
Keep in mind, when the relay is energized, if the positive or the ground connection on the coil is broken, the arm switches the connection between 30 back from 87 to 87a.

Quenching Diodes

It was said earlier that a relay energizes itself by applying positive from the battery to either 85 or 86 and grounding the other terminal. This is not absolutely true, some relays are "polarized" if they have a quenching/ suppression diode (A diode installed between the coil terminals 85 and 86, could be internal or external).
To activate the coil on this type of relay, make sure that the +12 volts trigger is on the same terminal of the relay as the anode (+ or non striped side) side of the quenching/suppression diode, and that the negative trigger is on the same terminal of the relay as the cathode (- or striped side) of the quenching/ suppression diode.
When a relay's coil is energized, a magnetic field is created and energy is stored in the coil. When power is removed from the coil, the magnetic field collapses. This causes a reverse voltage to be generated and can sometimes reach 200 volts. A quenching diode absorbs this reverse voltage spike.

A closer look at a relay

Now that you know what the main inscriptions are on the relay, take a look on the side, and you will see another inscription: 12 VDC, 40/ 30 A.
12 VDC: This indicates the coil voltage rating. For an automotive relay, it's usually 12 volts DC.
40/ 30 A: This indicates the current carrying capability of the contacts 30, 87, & 87A.
40: Indicates that the normally closed circuit (30 and 87a) can safely handle a maximum of 40 amps of current.
30: Indicates that the normally open circuit (30 and 87) can safely handle a maximum of 30 amps of current.

Examples:

The following examples demonstrate some of the most common uses for relays: isolation, inversion, interruption, strengthening current, and for powering multiple wires from one source safely.

Powering multiple wires from one source safely

Example: Powering a second ignition
Problem: You need to power multiple ignition wires to remote start the vehicle, but your module only has one ignition output available.
Solution: You will need to add a second ignition relay to power the second-ignition wire. (Jumping ignition 1 to ignition 2 is *never* recommended —Always use a relay. The vehicle circuits are isolated for a reason; the wiring of the remote star module should reflect this.)

The Relay Connections

85: Connects in parallel to the ignition 1 output from the remote start module. This becomes the positive side of the coil.
86: Connects to the Ground Out When Running wire from the remote start module. This becomes the negative side of the coil.
87: Connected to a fused +12 volts source, that is capable of supplying power for the vehicle's second ignition wire. This becomes the source of power for the 2nd ignition wire.
87A: No connection. This terminal is not used in this application.
30: Connects to the vehicle's second ignition wire. This becomes the output of the 2nd ignition relay.
Comments: The relay is only energized when the vehicle is running by remote start. When started with the key, the relay is not energized and the integrity of the stock system has been preserved.

Isolation:

Example: Isolating a park light output
Problem: Some vehicle circuits need to be isolated from feedback. In some cases, when a vehicle is remote started, feed back occurs on a circuit, and powers another device or switch, that was not intended to be powered during the remote starts.
The following example will be a positive (+) park light circuit that feeds back and activates the windshield wipers during remote starts.
Solution: When power is applied to the OEM park light wire it back feeds through the park light switch, and activates the wipers. Where the connection was made from the start module's park light output, and the vehicle's park light circuit, the OEM park light wire is cut to isolate the park light switch and the actual parking lights. A relay is added to the park light circuit so that power from the remote start module is only sent to the parking lights and not the parking light switch.

The Relay Connections

85: Connects to the +12 volt park light output from the remote start module. This becomes the positive side of the coil.
86: Connects to a negative source (*where the remote start module is grounded*). This becomes the negative side of the coil.
87: Connects to the +12 volt park light output from the remote start module. This becomes the power supply for the vehicle's park lights.
The OEM park light wire is cut. The side that is still connected to the switch becomes the “switch side”. The side that is still connected to the parking lights becomes “parking lights side”.
87A: Connects to the “switch side” of the cut OEM park light wire.
30: Connects to the “park light side” of the cut OEM park light wire.
Comments: When the relay is at rest, the OEM park light wire is connected (through 87A & 30) and allowed to operate normally. When the remote start module powers the park lights, the OEM park light wire is opened, and power from the remote start module is sent only to the actual parking lights (from 87 through 30).

Inversion:

Example: Activating a positive trunk release switch
Problem: The vehicle's power trunk release switch is activated by a positive (+) pulse, and the remote start module's trunk output is negative (-).
Solution: A relay is used to invert the negative signal from the start module to a positive signal before it is sent to the OEM switch.

The Relay Connections

85: Connects to the start module's trunk release output wire. This becomes the negative side of the coil.
86: Connects to a fused +12 volts source. This becomes the positive side of the coil.
87: Connects to a fused +12 volts source. This becomes the supply for the positive trunk release.
87A: No connection. This terminal is not used in this application.
30: Connects to the OEM trunk wire in the vehicle.
Comments: At rest, the trunk switch is allowed to operate normally. When the trunk button is pressed, the negative trunk output from the remote start module triggers the relay. When the relay is activated, +12 volts from 87 is sent through 30, and the OEM trunk switch is activated, by the positive pulse.

Interruption:

Example: Creating a starter disable relay to prevent unauthorized starting of the vehicle.
Problem: The OEM starter circuit needs to be disabled only when theft is attempted.
Solution: A relay is used to interrupt the OEM starter wire. There is an output on the remote start module especially for this purpose (starter disable output).

The Relay Connections

85: Connects to the starter disable output wire from the remote start module. This becomes the negative trigger for the coil.
86: Connects to the vehicle's ignition wire. This becomes the positive trigger for the coil.
87: No connection. This terminal is not used in this application.
The vehicle's OEM start wire is cut. The side of the wire that is still connected to the ignition switch becomes the “key side” of the starter wire. The side of the wire that is still connected to the starter motor becomes the “starter side” of the of the starter wire.
87A: Connects to the “key side” of the cut OEM starter wire.
30: Connects to the “starter side” of the cut OEM start wire.
Comments: At rest the relay is not active, and +12 volts on the starter wire passes through the relay (through 87A & 30) normally. The starter disable output wire on the remote start module is activated when the LOCK button is pressed on the remote control.
When a theft attempt happens, and the thief powers the ignition circuit (to hot-wire the vehicle), and the starter disable was armed (by the LOCK button on the remote), the starter disable relay activates. The OEM start wire is now open, (does not make connection) because 30 is no longer connected to 87A, and the vehicle is unable to start.

Strengthening Current:

Example: Strengthening an output

Problem: A vehicle has a negative (-) trigger trunk release wire. The module has a negative trunk release output wire. The remote start module is unable to supply the necessary current to activate the vehicle's trunk release wire.

Solution: A relay is used to provide the necessary negative current to active the vehicle's trunk release wire.

The Relay Connections

85: Connects to the start module's trunk release wire output. This becomes the negative trigger for the coil.
86: Connects to a fused +12 volt source.
87: Connects to a negative source (*where the remote start module is grounded*). This becomes the supply for activating the vehicle's trunk release wire.
87A: No connection. This terminal is not used in this application.
30: Connects to the vehicle's trunk release wire.

Comments: At rest the relay is not active and the vehicle's trunk release switch is allowed to operate normally. When the trunk release button is pressed, the start module's trunk release output activates the relay. The ground signal is sent from 87 through 30 to the vehicle's trunk release wire activating the switch and opening the trunk.

Clutch Bypass

In order to remote start a manual transmission vehicle, the clutch switch must be bypassed. Clutch safety switch circuits can take many forms. Listed below are the most common ones. When testing to determine the type of clutch circuit, it is recommended to use a computer safe logic probe. Some vehicles may also have a separate or combined switch on the clutch pedal for cruise control. Usually a cruise control switch reacts the moment you touch the pedal, where as a clutch switch reacts only when the pedal is near the floor. Once the circuit type has been determined, you must recreate what happens electrically at the switch, with the remote start module, to bypass the clutch during remote starts. Relays are often used to accomplish this. Always use the Ground Out When Running (G.O.) as the negative trigger on your clutch bypass relays, as it is only active during remote starts.

NEVER permanently bypass a clutch switch. Do not attempt this if you are unfamiliar with the use of relays, and diode isolation.

Before any Hot wiring attempts:

Test and record the way each wire tests in the following positions:

With out the pedal pressed:

- test the wires with the Ignition OFF
- test the wires with the Ignition ON
- test the wires with the Key in the start position

With the pedal pressed:

- test the wires with the Ignition OFF
- test the wires with the Ignition ON
- test the wires with the Key in the start position
- With this information for every wire at the switch, determining what type of clutch switching system you have will be easy.

Direct Feed:

The simplest type of system to test and bypass is the “Direct Feed” system. This circuit simply interrupts the +12v signal starter wire from the ignition switch to the starter solenoid. There are 2 wires in this circuit, the “key side” wire which goes from the clutch pedal to the Ignition switch, and the “solenoid side” which goes from the clutch switch to the starter motor. When the key is turned to the start position without pressing the pedal, you will test 12v only on one of the wires at the clutch switch, this is the key side. When the pedal is pressed down, and the key is in the crank position, the other wire will also read 12 volts; this is the solenoid side wire. To confirm you have a direct feed clutch switch, hot wire the “solenoid side” wire with a fused +12 volts and the starter motor will crank. Connect the starter output from the remote starter to solenoid side wire.

Note: In the next two systems a Relay in the vehicle interrupts the start wire between the Ignition switch and the starter motor. With the key in the START position, and the clutch pedal pressed, the relay energizes and allows the start signal to reach the starter motor. In these systems a wires from the clutch triggers the relay, when the pedal is pressed. There will be another wire at the clutch switch that supplies the signal to the trigger wire (either positive or negative, depending on the system)

Negative:

In a Negative system, when the clutch is pressed; a negative signal is sent to the relay, the relay energizes, when the Key is turned to the start position the 12volts from the start wire is allowed to pass through the relay and to starter motor. One of the wires at the clutch will test as negative, this is the supply wire. The relay's negative trigger wire will only show negative when the pedal is pressed (some vehicle's also require the Ignition system to be powered). To confirm you have a Negative system, hot wire the negative trigger wire by jumping it to a ground source with your fused test jumper. You should now be able to turn the key to the start position and engage the start motor without pressing in the clutch pedal. If there is nothing else connected to the Ground Out When Running (G.O.) wire from the remote start module, the G.O. wire should be strong enough to trigger the vehicle's clutch relay. If there are other devices or modules connected to the G.O. Wire, a relay (and diodes) may have to be added to strengthen the negative current going to the clutch bypass.

Positive:

Very similar to the negative system, except that the vehicle's clutch relay is trigger by 12 volts, instead of a negative signal. In a Positive system, when the clutch is pressed; a positive (12 volts) signal is sent to the relay, the relay energizes, when the Key is turned to the start position the 12 volts from the start wire is allowed to pass through the relay and to starter motor. One of the wires at the clutch will test as 12 volts, this is the supply wire. The relay's positive trigger wire will only show positive when the pedal is pressed (some vehicle's also require the Ignition system to be powered). To confirm you have Positive system, hot wire the positive trigger wire by jumping it to a 12 volt source with your fused test jumper. You should now be able to turn the key to the start position and engage the start motor, without pressing in the clutch pedal. A relay is needed to send 12 volts to the trigger wire from the start module during start attempts.

Normally Closed (N/C):

Note: There are different types of this system used by various vehicle manufacturers; the following is used to illustrate how these systems work in general.

A Relay is also used in these types of systems to interrupt the starter wire. In the previous two examples, the clutch was bypassed by engaging the clutch relay; with this system you bypass the clutch by preventing the clutch relay from engaging. When the Ignition Key is turned to the start position the relay energizes and interrupts the start wire, when the pedal is not pressed. When the Ignition key is turned to the start position, and the pedal is pressed, the relay does not energize, and the start signal reaches the starter motor.

In a N/C system the supply wire is connected to the relay's trigger wire at rest (pedal not pressed). When the pedal is pressed, the connection is broken between the supply wire and the relay's trigger wire (this disengages the relay). To verify that you have a N/C system, disconnect the clutch switch and the vehicle should start without the clutch pedal being pressed. When you test the trigger wire with your logic probe, the trigger wire will test as 12 volts or negative when the pedal is not pressed, it should read as an open circuit (or Float) when the pedal is pressed.

PLEASE NOTE

Your probe may also show feed back from the other end of the circuit. The Polarity of the Trigger wire does not matter in this system, since all you need to do in order to bypass it is to use a relay to interrupt it during remote starts.

Harness Description

When connecting the Module, it is important to make sure the connector with the Ground wire is connected first before making the 12-volt connections. Should the unit be powered before being grounded, there could be serious damage to internal components of the unit. Be careful not to power up a Module before it is properly grounded. To avoid any accident, it is recommended to pull out the fuses from their sockets before the installation, and to put them back during the very last steps.

6-Pin Main Ignition Harness

Wire		Description
A	RED +12 V Battery	Connect to the largest 12 V supply wire at the Ignition harness. Ensure that the OEM power wire is fused for more than 30 A. NOTE: certain new vehicles have no suitable 12 volts source at the IGNITION switch (the 12 Volt wire is too small to supply the necessary current). In this case, the fuse box, or the B+ connection on the battery is recommended.
B	PURPLE (+) 30 A starter output	Connect to the Starter wire of the vehicle (at the IGNITION switch). The source wire should have +12 V with the Ignition Key in the CRANK position only.
C	RED +12 V Battery	Connect to the largest 12 V supply wire at the Ignition harness. Ensure that the OEM power wire is fused for more than 30 A. NOTE: certain new vehicles have no suitable 12 volts source at the IGNITION switch (the 12 Volt wire is too small to supply the necessary current). In this case, the fuse box, or the B+ connection on the battery is recommended.
D	YELLOW (+) 30 A Ignition output	Connect to Ignition wire of the vehicle. The source wire should have +12 V with the Ignition Key in the IGNITION ON (RUN) and CRANK positions. Warning! Some vehicles have more than one IGN wire at the IGNITION switch for powering the heater blower motor. Use the 5th relay (pin F) and extra relays to power up any extra IGN. wires if necessary. DO NOT JUMP WIRES at the IGNITION switch, this will compromise the OEM electrical system.
E	ORANGE (+) 30 A Accessories output	This wire is for powering the heater blower motor. It is usually classed as an ACC. (no power in the CRANK position.) if it tests as an IGNITION (power in the crank pos.) then power it as an IGNITION (5th relay, or extra relay). Warning! Some vehicles have more than one ACC wire at the IGNITION switch for powering the heater blower motor. Use the 5th relay (pin F) and extra relays to power up any extra ACC. wires if necessary. DO NOT JUMP WIRES at the IGNITION switch; this will compromise the OEM electrical system.
F	GREEN (+) 30 A 5th relay output	This high-current output can be used to power a 2nd IGNITION or a 2nd ACCESSORY or a 2nd STARTER WIRE. See jumper settings in 5th relay section later in the guide for correct output position (page-15). Additional IGNITIONS, ACCESSORIES, or STARTER WIRES must use external relays. DO NOT JUMP WIRES at the IGNITION switch, this will compromise the OEM electrical system.

5-Pin Secondary Harness

Wire		Description
1	BLACK (–) Chassis ground input	This wire must be connected to bare, unpainted metal (the Chassis or true Body ground). It is preferable to use a factory ground bolt rather than a self-tapping screw. Screws tend to get loose or rusted over time and can cause erratic problems.
2	PURPLE (AC) TACH input	This wire tells the Module if the Engine is running or not. It requires at least 1.8 volts (AC) and 1.5 Hz (or faster) at idle. Common Tach references are: the negative side of an injector, the negative side of an Ignition Coil, Camshaft sensor, Crankshaft sensor or the Engine Control Module (ECM). NOTE: A Tach signal that is too low will cause the Module to "over crank" and a Tach signal that is too high will cause the Module to "under crank".
3	GRAY (–) Hood Switch input	Connect this wire to the Hood Pin-switch supplied. This input will disable or shut down the Remote Starter when the Hood is opened. It is also used for programming and therefore it is essential that it is installed.
4	ORANGE (+) Brake Switch input	This wire must be connected to the Brake Light switch of the vehicle. The wire should be +12 V only while the Brake Pedal is pressed. This input will shut down the Remote Starter if the Brake Pedal is pressed. It is also used for programming and therefore it is essential that it is installed.
5	YELLOW (+) +12 V Parking Light output	This wire provides a +12 V output (15 A max.) and must be connected to the Parking Light wire that tests +12 V when the Parking lights are ON. NOTE: Ensure that the voltage does not vary when the dimmer control switch is turned up or down. If this is the case, selected the wrong wire. There is also a negative Parking Light output. Only one of these two different outputs needs to be connected.

12-Pin Accessories Harness

Wire		Description
1	BLUE (–) AUX 3 (Trunk) output	500 mA negative output. This output can be used to control Trunk release (1-sec. pulse). Note: AUX 3 (TRUNK) operates only when Ignition is OFF or when the vehicle is running under remote control.
2	BROWN (–) Lock output	Programmable 500 mA, 7/10sec. or 4 sec negative output.
3	GREEN (–) Unlock output	Programmable 500 mA, 7/10sec., 4sec., or double 1/4 sec. pulse negative output.
4	WHITE / BROWN (–) Arm output	500 mA ground output when the button is pressed. This output is activated 500 ms before the LOCK pulse and deactivated at the same time as the LOCK pulse ends. Note: The system will also give an ARM/REARM pulse on this wire when it shuts down the vehicle after a remote start.

Wire		Description
5	WHITE / GREEN (–) Disarm output	500 mA ground output when the button is pressed. This wire is for disarming OEM Alarm systems. Note: System will also give a DISARM pulse before remote start.
6	BLUE / WHITE (+) Positive Door input	This input should be used in vehicles that use a positive-switching Dome Light circuit. Connect to a Dome Light wire testing +12 V with a Door open. CAUTION! You can only use either the NEGATIVE DOOR INPUT or the POSITIVE DOOR INPUT wire. It is essential that the Module be connected in such a way as to allow each one of the Doors to be detected by the remote starter.
7	WHITE / ORANGE (–) Starter Kill output	The unit is equipped with a selectable passive- or active-arming Starter Kill circuit that will immobilize the vehicle when the system is armed. This wire will provide a constant 500-mA negative output when the system is armed (locked by remote) or if remote started. This wire should be connected to a Single Pole Double-Throw Relay (This wire will connect to Pin 85, on the Relay, and Pin 86 will be connected to the Ignition wire). A second benefit of the Starter Kill is the Anti-Grind feature. When the vehicle has been remote started the Anti-Grind prevents the starter motor from re-engaging when the ignition key is inserted in the Ignition switch and accidentally turned to the CRANK position (The Starter Kill output becomes active during remote starts).
8	ORANGE (–) Parking Brake input	This input is for manual transmission vehicle ONLY. It is used in the Ready Mode sequence and must be connected. The Parking Brake input must be given a ground signal (-) when the Parking Brakes are applied.
9	PURPLE (–) External Trigger input	The External Trigger wire can be used for remote-starting/ stopping the vehicle with an external device. When the vehicle is running, triggering this input will also activate Idle Mode.
10	WHITE (–) Ground out when running	This wire provides a constant 500 mA negative output while the vehicle is remote started. The output becomes active 1.5sec before Ignition, and becomes inactive when the Module shuts down. The output can be used to activate external relays, bypass kits, etc. CAUTION! If multiple relays or modules are connected to the Ground Out wire, ensure that they are all diode isolated in order to avoid feedback and damaging the vehicle.
11	GRAY (–) Negative Door input	This input should be used in vehicles that use a negative-switching Dome Light circuit. Connect to a wire that tests ground with a door open. CAUTION! You can only use either the NEGATIVE DOOR INPUT or the POSITIVE DOOR INPUT wire. It is essential that the Module be connected in such a way as to allow each one of the Doors to be detected by the remote starter.

Wire		Description
12	YELLOW (+) Glow-plug input	This positive input will monitor the Glow Plug Light in Diesel Mode: it will wait until the Glow Plug Light goes out to crank the Engine. Connect to the side of the Glow Plug Light that becomes positive when the Light is on. Note: In Diesel Mode there is an 18-sec. crank timing delay (or approximately 25-sec. if the run time is set to 30 min.): if the Glow Plug Light is still on after the delay expires, the module will proceed to start the Engine. (Also known as the "wait-to-start light".) The purpose of the Glow-plug circuit on diesel vehicles is to pre-heat the Combustion Chamber before the vehicle is started. When a Remote Starter is installed on a diesel vehicle, the Glow- plug section of the Ignition circuit must be activated and allowed to operate before the vehicle is remote-started. For that purpose, the Glow-plug input wire of the module must be connected to the Glow-plug indicator light of the vehicle. The module will only accept positive Glow-plug input signals, if the signal is negative, use a relay to invert its polarity. A diode must be added between the negative Glow-plug trigger on the relay and the negative Glow-plug wire of the car. This is to prevent feedback effects on the Glow-plug indicator light on the instrument cluster: the light on the dash would come on because of the feedback, even though the circuit is off. When the user remote-starts the vehicle: The module will power up the Ignition circuit and wait to engage the Starter Motor while the Glow-plug indicator light is still on. The module will engage the Starter Motor as soon as the Glow-plug light (+) goes out. Minimum waiting time is 4 seconds. Maximum waiting time is 30 seconds (approximately). If no Glow-plug wire is found on the vehicle, the Glow-plug input on the module may be "timed out". The module will power up the Ignition and Glow-plug circuits and simply wait for the time-out before starting. Keeping the Glow-plug input wire of the module unconnected will hold the ignition on for the preprogrammed delay. Warning! Please program the tach before connecting the glow-plug input to the vehicle.

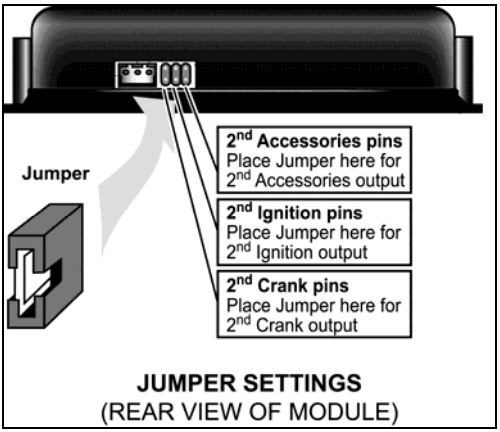
3-pin Harness

Wire		Description
1	GRAY/ LIGHT BLUE	N/A
2	BLUE / WHITE (–) AUX 1 Output	Programmable 500 mA negative output.
3	YELLOW / WHITE (–) Parking lights output	500 mA negative Parking Light output Note: Ensure that the voltage does not vary when the dimmer control switch is turned up or down. If this is the case, you have selected the wrong wire. WARNING! There is also a positive Parking Light output. Only one of these two different outputs needs to be connected.

Auxiliary Relay

Fifth Relay Output (2nd IGN, ACC or CRANK)

Remote car starters of this series are equipped with an on-board high-current programmable 5th relay that can be used to power a second ignition, accessory or crank wire. The unit uses 3 sets of pins; each set corresponds to a specific function of the output. In order to activate one of the three possible functions, you must place the jumper (supplied) on one of the three sets of pins and connect the 14 AWG wire to the second IGN. / ACC. / CRANK wire of the vehicle.


Jumper
2nd Accessories pins
Place Jumper here for 2nd Accessories output
2nd Ignition pins
Place Jumper here for 2nd Ignition output
2nd Crank pins
Place Jumper here for 2nd Crank output
JUMPER SETTINGS
(REAR VIEW OF MODULE)

Caution!
Only one set of pins can be used at one time. Using more than one jumper may result in serious damage to the vehicle.
The relay output rating on this unit is 25A at most. Defective OEM solenoid switches can sometimes draw up to 50 or 60a, causing the 30A fuse to blow. Always verify your circuit with an appropriate measuring device.

Manual or Automatic Transmission

This module may be installed on vehicles with manual or automatic transmissions. It is originally configured for manual transmissions. If the vehicle you are working on is automatic, it is mandatory to make a few quick and easy modifications before the unit is connected. In the event that the configuration requires changes afterwards, a complete reset will be necessary before those changes become effective.

To install this unit in a vehicle with a manual transmission:

1. Make sure the Yellow loop on the PC board is connected.
2. Connect the Orange handbrake wire located on the 12-pin harness to the vehicle handbrake switch.
3. Connect the Blue/White (+) door input OR the Grey (-) door input wire located on the 12-pin harness to the vehicle door pin wire, which monitors all the doors of the vehicle (only use 1 of the 2 door trigger inputs).
4. Make sure the Purple TACH wire is plugged in – the TACH wire MUST be hooked up when the module is set for a manual transmission.
5. Make all your regular connections.
6. Power up the unit by first inserting the 5-pin connector, then the 6-pin connector and finally the 12-pin connector. The parking lights will flash 4 times to confirm that the unit is in manual mode.
7. When learning the transmitter, the parking lights will flash 5 times quickly, confirming that the module is set to manual mode.
8. Upon the first successful remote start, the system will lock the transmission settings to manual mode.

To install this unit in a vehicle with an automatic transmission:

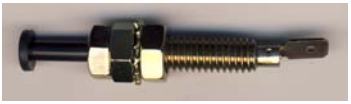
1. Cut the loop on the pc board (Yellow wire).
2. Make sure the Orange handbrake wire is not connected to any of the vehicle circuits.
3. Make all the regular connections.
4. Power up the unit. The parking lights will flash 4 times.
5. When learning the first transmitter, the parking lights will flash 5 times quickly.
6. Upon the first successful remote start once the yellow loop has been cut, the system will lock the transmission settings to automatic mode.

Note1: When learning the first transmitter after the unit is RESET, the parking lights will flash 5 times quickly followed by 2 slow flashes confirming that the module is set to automatic mode.

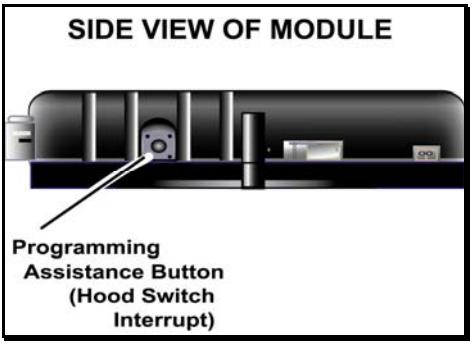
Note2: If upon pressing the button, the parking lights give 3 slow flashes, make sure that the Orange handbrake wire is not connected and that the yellow loop is cut and isolated.

Entering Programming Mode

This allows the installer to program the unit. Once the system is in programming mode, the installer will have up to 20 seconds to select one of the sub-menus. If the installer fails to select a sub-menu before the 20-second delay, the system will exit programming mode.

Using the Hood Pin	Using the Antenna Programming Assistance Button (A.P.A.B.) (Optional)
	
• Press and hold the hood pin for 4 seconds.	• Make sure the hood is closed.
• Release the hood pin. The parking lights will turn ON.	• Turn the ignition key to the IGNITION ON (RUN) position.
• While the parking lights are ON, press the hood pin once more and release immediately. The parking lights will turn ON and stay ON for 20 seconds.	• Within 5 seconds, press the programming button on the antenna twice for 1 second each time. The LED will come ON solid.
• You now have 20 seconds to select one of the sub-menus.	• You now have 20 seconds to select one of the sub-menus.
Note: To exit programming mode, close the hood.	Note: To exit programming mode, press on the antenna button once (the LED will come ON) and release.

The Programming Assistance Button (a.k.a. PAB)



The PAB is located on the side of the module. This push button mimics the hood-pin switch in order to avoid having to get out of the vehicle and pressing the hood-pin switch. The PAB will work only when the hood is up.

Sub-menus:

a) Transmitter Programming
b) Programming Options
c) Honk Horn Timing Adjustment
d) Tach Programming

Note: For vehicles that require the ignition to be turned ON to activate the brake, follow these steps:

a. After flashing the hood, turn the ignition ON; The parking lights will turn OFF
b. After 4 seconds the parking lights will turn ON and then press the brake.

Transmitter Programming Procedure

1) Enter programming mode (page-17) - the parking lights will stay on for up to 20 seconds.
2) Before the lights go out, turn the ignition key to the IGNITION ON (RUN) position and immediately to the OFF position.
3) Press and hold the LOCK button and keep it down until the parking lights flash 5 times quickly.
4) The transmitter has been stored in memory.

Note: Each unit can store 4 remotes in its memory.

To program a transmitter on the second vehicle for multi-car operation, you must press the button (instead of or) in step 3 of the transmitter programming procedure:

Entering Programming Options

1) Enter programming mode (page-17) — the parking lights will stay on for up to 20 seconds.
2) Before the lights go out, press and hold the brake pedal and then press one of the following buttons:
   i) LOCK ---------- to access mode 1;
   ii) UNLOCK ---------- to access mode 2;
   iii) TRUNK ---------- to access mode 3;
3) The parking lights will flash once, twice, or three to confirm entry into a mode.
4) Release the brake pedal.

Once the desired mode has been selected, the unit will fall (by default) into function #1 of that mode; you can now select the option you want in function 1. Once this option has been chosen, the parking lights will flash one, two or three to confirm your chosen option. <u>You can not jump over the Function!</u> The unit will move on to function 2 of themode selected, and so on.

LOCK ---------- for Option 1,
UNLOCK ---------- for Option 2,
TRUNK ---------- for Option 3;

Programming option

MODE 1 (* indicates default setting)

FUNCTION 1 – Ignition-controlled door locks
- OPTION 1* Ignition-controlled door locks DISABLED
- OPTION 2 Ignition-controlled door locks ENABLED

FUNCTION 2 – Secure Lock
- OPTION 1* Secure lock DISABLED
- OPTION 2 Standard secure lock ENABLED

FUNCTION 3 – Starter Kill arming mode
- OPTION 1* Passive arming (60 sec.)
- OPTION 2 Active arming
- OPTION 3 Passive arming (3 min.)

FUNCTION 4 – Door lock pulse timing
- OPTION 1* 7/10-sec. lock / unlock pulses
- OPTION 2 4-sec. lock / unlock pulses
- OPTION 3 7/10-sec. lock pulse and two ¼ -sec. unlock pulses

FUNCTION 5 – LED flashing
- OPTION 1* Enabled (without starter kill)
- OPTION 2 Disabled
- OPTION 3 ENABLED (with starter kill)

MODE 2 (* indicates default setting)

FUNCTION 1 - Engine Run Time
- OPTION 1 Run Time = 3 minutes in gas mode / 8 minutes diesel mode
- OPTION 2* Run Time = 15 minutes in gas mode / 20 minutes diesel mode
- OPTION 3 Run Time = 25 minutes in gas mode / 30 minutes diesel mode

FUNCTION 2 – Idle Mode & Turbo Mode (auto) / Turbo Mode (manual)
- OPTION 1 Idle mode & turbo mode DISABLED (auto) / turbo mode DISABLED (manual)
- OPTION 2* Idle mode & turbo mode ENABLED (auto) / turbo mode DISABLED (manual)
- OPTION 3 Idle mode & turbo mode ENABLED (auto) / turbo mode ENABLED (manual)

FUNCTION 3 – Engine type and Cold Weather Mode
- OPTION 1 Diesel mode with 20-minute run time in cold weather mode (30-sec. wait to start delay)
- OPTION 2* Gas mode with 3-minute run time in cold weather mode
- OPTION 3 Diesel mode with 8-minute run time in cold weather mode (18-sec. wait to start delay)

FUNCTION 4 – AUX 1 programming
- OPTION 1 Horn confirmation upon the 2nd press of the LOCK button
- OPTION 2* Priority door access
- OPTION 3 Horn confirmation upon the 1st press of the Lock button.

FUNCTION 5 – Pager (Pager sold separately)
- OPTION 1 Pager ENABLED
- OPTION 2* Pager DISABLED

MODE 3 (* indicates default setting)

FUNCTION 1 – Ready Mode Option
- OPTION 1 Enabled by handbrake
- OPTION 2* Enabled by remote

FUNCTION 2 – Bypass
- OPTION 1 ADS
- OPTION 2* Xpresskit
- OPTION 3 Fortin

FUNCTION 3 – Bypass Type
- OPTION 1 One Way communication
- OPTION 2* Two Way communication (For Xpresskit bypass ONLY)

Virtual Tach System

Virtual Tach System combines the latest microcontroller technology and a complex algorithm that took years to develop. VTS is able to effectively monitor the engine starting sequence and release the starter at the right time without physically connecting the tach wire to the remote starter. The VTS constantly monitors the data and readjusts itself automatically in order to maximize its capability to start the engine properly in any weather or deteriorating battery condition
Note: Virtual Tach System is only available in ***automatic transmission.***

Optional Time Delay Adjustment in Virtual Tach System

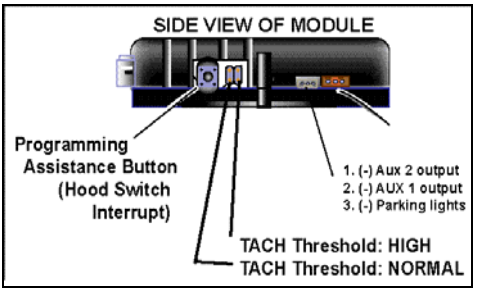
Follow these steps to program crank time adjustment, if needed:

1. Enter programming mode (page-17) — the parking lights will stay on for up to 20 seconds.
2. Before the lights go out, press and hold the brake pedal and press the and buttons simultaneously — the parking lights will flash 4 times. Do not release the brake pedal.
3. Press the button if you wish to increase the time delay or the button if you want to decrease it. The time delay will be increased or decreased by 50ms. and the parking lights will flash once every time the or button is pressed.
4. Press the button to save the settings you have entered. The parking lights will flash 5 times.
5. Release the brake pedal – the time delay programming is now complete.

Tach Learning

Tach jumper settings

Some new vehicles have a higher TACH voltage threshold, which would fall out of the normal TACH trigger circuit of the remote car starter. Changing the jumper to TACH Threshold HIGH will allow the module to properly detect the TACH signal.


SIDE VIEW OF MODULE
Programming Assistance Button (Hood Switch Interrupt)
1. (-) Aux 2 output
2. (-) AUX 1 output
3. (-) Parking lights
TACH Threshold: HIGH
TACH Threshold: NORMAL

Multi-speed Tach Programming Procedure

The system is designed to read a wide range of Tach signals produced by newer Ignition systems. Note that you should go through the Tach programming procedure every time a new Unit is installed.

1. Enter programming mode (page-17) — the parking lights will stay on for up to 20 seconds.
2. Before the lights go out, press and hold the brake pedal and press the and buttons simultaneously — the parking lights will flash 4 times.
3. Release the brake pedal.
4. Start up the engine and allow the vehicle to reach regular engine idle speed.

5. Once the engine is running at normal idle speed, press the brake pedal and keep it down until you hear the parking lights output click 5 times.
6. Release the brake pedal —the tach programming is now complete.

Note: If another Tach programming is required, simply repeat the "Multi Speed Tach learning".

Auto Tach Programming Procedure

This process can be carried out instead of the conventional Tach Programming Procedure.

1. Make sure all the connections are done properly and that the Module has been powered-up.
2. With the Hood up (Ground on the Hood Pin line), start the vehicle using the key.
3. Let the Engine reach proper idle speed
4. Press and hold the Brake Pedal until the Parking Light output from the Module flashes 5 times.
5. Turn the Ignition OFF. At this point, the Tach setting has been programmed.

Note: The "Auto tach programming" can only be carried out once unless the system is reset.

Setting the Unit into Ready Mode

Setting Your Vehicle Into Ready Mode

If your vehicle has a manual transmission you must read the following indications. The unit must first be set to Ready Mode in order to start the vehicle by remote. If the unit is not set to Ready Mode, it cannot remote start the vehicle.

Please note that Ready Mode can be enabled by the remote or the handbrake, depending on the option that was selected by your installer. Therefore, you must follow the appropriate procedure between the two described below in order to set your vehicle into Ready Mode.

Once the system is set to Ready Mode, the vehicle can be remote started and stopped at any time. The system will exit Ready Mode if a door, the hood or the trunk is opened, if the brake pedal is pressed, if the parking brake is disengaged or if the ignition key is turned to the IGNITION ON (RUN) position.

To set the system to Ready Mode:

If Ready Mode is enabled by remote	If Ready Mode is enabled by handbrake
1. Ensure that all the doors, hood and trunk are closed. Make sure that the gear selector is in the neutral position.	
2. With the engine already running, apply the parking brake once and release the brake pedal.	2. With the engine already running, apply the parking brake twice within 10sec. Make sure to release the brake pedal. The parking lights will flash 3 times quickly and remain lit. Skip to step 4.
3. Within 20 sec. of engaging the parking brake, press and hold , , or on the transmitter. The parking lights will flash 3 times quickly and remain lit.	-
4. Remove the key: the engine will continue running.	
5. Exit the vehicle and close all doors, hood and trunk.	
6. Press for approx. 1 second either:	

- to lock the doors and shut down the engine;
- to unlock the doors and shut down the engine;
- to shut down the engine without affecting the doors.

7. The Parking light will flash twice to confirm ready mode activation.

Horn Timing Adjustment

Follow these steps to adjust horn pulse timing:

1. Enter programming mode (page-17) - the parking lights will stay on for up to 20 seconds.
2. Press and hold the brake pedal, then simultaneously press the and buttons — the horn will chirp 5 times.
3. Release the brake pedal.
4. To change the timing:
   a. To increase the Horn pulse by 3 ms, press the button.
   b. To decrease the pulse by 3 ms, press the button.
   c. To increase the pulse by 10 ms, press the button.
   d. To decrease the pulse by 10 ms, press the button.
5. To save the new settings: press and . The horn will honk three times to indicate that the settings have been successfully saved.

Arming and disarming the starter kill

This added security feature will prevent the vehicle from starting with the Ignition key when the starter kill is armed. If the system was installed with the starter kill option, you will not be able to start the vehicle with the key unless the system has been unlocked first or put into Valet Mode.

Note: If the Starter Kill is installed, the vehicle will benefit from a protection against starter motor damage that could occur after remote-starting the engine should the user, by force of habit, turn the ignition key to the CRANK position.

The Starter Kill (if installed) can be configured by the installer either to Passive Mode (so as to arm automatically) or Active Mode (so as to require the user's intervention for arming). By default, the Remote Car Starter is configured to Passive Mode.

Passive mode:

To arm the Starter Kill, press the button on the transmitter, OR

1. In Passive Mode, the Starter Kill will also arm automatically 1 minute (by default) or 3 minutes (if configured this way) after the ignition is turned OFF or once the last door is closed (if the doors are monitored).
2. The LED on the antenna will remain OFF during the countdown preceding the activation of the Starter Kill.
3. Once the activation countdown expires, the LED will flash slowly to indicate that the Starter Kill is now armed.

To disarm the Starter Kill, press the button on the transmitter.

- The Starter Kill will automatically rearm itself after 1 minute (by default) or 3 minutes (if configured this way) if no door is left opened (if the doors are monitored) and the ignition is not turned ON.

Active Mode:

To arm the Starter Kill, press the button on the transmitter.

1. The parking lights will flash once.
2. The LED on the antenna will flash slowly.

To disarm the Starter Kill, press the button on the transmitter.

1. The parking lights will flash twice.
2. The LED on the antenna will remain OFF.

Installation-programmable Features

The following features can be programmed according to the needs of the installation and the requirements of the user:

Ignition-Controlled Door Locks

- Ignition Lock disabled: turns OFF the Ignition Lock feature.
- Ignition Lock enabled: locks all Doors when the key is in the ON position and the user presses the Brake Pedal. Similarly, when the Ignition key is turned to the OFF position, the Doors will unlock.

Secure Lock

This feature allows the module to control certain OEM factory alarm systems without requiring the use of other wires for disarming the OEM alarm. (Namely, this feature is designed for OEM systems that use the factory lock wire to arm the alarm and the unlock wire to disarm it.)

1) Standard Secure Lock disabled: By default, the unit will send a disarm pulse before IGN, an arm pulse once the car is remote started and an arm pulse 4 sec after it shuts down the engine.
   Note: No lock pulse and unlock pulse is sent at any moment of the remote start sequence.

2) Standard Secure Lock: If this Option is selected, at remote start, the module will send an unlock/disarm pulse (disarming the factory Alarm) before start-up, lock pulse when the engine is running, and lock/arm pulse 4 seconds after it shuts down the engine.

   Note: The unit DOES NOT send an arm pulse while the engine is under remote start.

3) Smart Secure Lock:
   a) If the vehicle was previously locked with the remote starter transmitter, at remote start the module will send an unlock/disarm pulse before start-up, lock pulse when the engine is running, and lock/arm pulse 4 seconds after it shuts down the engine.

   b) If the vehicle is initially unlocked, the unit will not send a lock pulse, arm pulse, unlock pulse or a disarm pulse at any moment of the remote start sequence.

   Note: The unit DOES NOT send an arm pulse while the engine is under remote start.

LED Flashing

1. Enabled without Starter kill: The LED will only flash if IGN is OFF
2. Disabled: LED flashing is disabled at all times.
3. Enabled with Starter kill: The LED will only flash when the Starter kill is armed.

Engine Run Time

On a gas engine, the Remote Car Starter can be programmed to run the engine for 3, 15, or 25 minutes (15 minutes by default). On a diesel engine, the Remote Car Starter can be programmed to run the engine for 8, 20, or 30 minutes (20 minutes by default).

Idle Mode

Convenience feature: Idle Mode allows you to keep the engine running and the doors locked while you stop, for example, at a convenience store or for a short delivery.

This feature allows you to let the remote starter take over control of the vehicle (i.e. no Key in the Ignition Switch) while the engine is running.

If your vehicle has an automatic transmission, proceed as follows to set the system to Idle Mode:

1. With the engine running, make sure to release the brake pedal and press the , or button on the transmitter until the parking lights come ON.
2. Remove the ignition key from the ignition switch.
   The engine will continue running.
3. Exit the vehicle and close all doors, hood and trunk.
4. Press the , button to leave the doors locked and the starter kill armed.

If your vehicle has a manual transmission, Idle Mode can be activated through the same routine as that used for Ready Mode (page-21); at the last step, press button to lock the doors and leave the engine running.

Note1: The engine will continue running until the user re-enters the vehicle or until the expiration of the engine run time.

Note2: If the pre-programmed run-time expires or if the user shuts down the engine by remote control, the vehicle will enter Ready Mode.

Caution!!! Do not leave children or pets unattended in a vehicle standing in Idle Mode.

Turbo Mode

If Turbo Mode is configured at installation, it will allow a turbocharger to idle down after the user leaves the vehicle: the unit will take over the vehicle and keep it running for 60 seconds (or until it is shut down by remote control), then shut down the engine.

If your vehicle has an automatic transmission, proceed as follows to set the system to Turbo Mode:

1. With the engine running, make sure to release the brake pedal and press the , or button on the transmitter until the parking lights come ON.
2. Remove the ignition key from the ignition switch.
   The engine will continue running.
3. Exit the vehicle and close all doors, hood and trunk.
4. Press the button; this will lock the doors and confirm that the vehicle is in Turbo Mode.

5. The engine will shut down after 60 seconds.

If your vehicle has a manual transmission, follow all steps of the Ready Mode routine (page-21) to activate Turbo Mode. At the last step,

- Press to lock the doors and have the engine shut down after 60 seconds; The parking lights will flash 3 times and remain lit.
- Press to unlock the doors and have the engine shut down after 60 seconds; The parking lights will flash 3 times and remain lit.
- Press to shut down the engine without affecting the doors.

Note: The vehicle will enter Ready Mode once the engine run time expires.

Engine type – Gas or Diesel

Set to gas mode by default, the unit can also be programmed to operate in Diesel mode. In diesel mode, the crank timing delay can be set to 18-sec or 30sec. Refer to the programming option table (page-19).

AUX 1

Note: This 500 mA negative Aux 1 output can be used for many different applications

Priority door:

This great feature allows the user to unlock solely the driver's door with a single press of the button on the transmitter, and to unlock the other doors, if desired, by pressing the button for a second time.

The output will provide a 1-second negative output when the button is pressed a second time on the transmitter.

Horn Confirmation:

AUX 1 can be programmed to trigger the horn every time the button is pressed, or when the button is pressed twice within 3 seconds. When horn confirmation is activated, panic mode is enabled. If horn confirmation is disabled, panic mode will not be available.

Bypass

Remote starters of this series have the ability to work in two way mode (D2D) with Xpresskit bypass modules. They also offer one way communication with Xpresskit, ADS and Fortin brand bypass modules.

Note: For Hardware 5.0 and higher there can only be one bypass connected to the unit.

Multi-Car Operation

This option allows the owner of two vehicles, both equipped with identical systems, to control both systems with only one remote transmitter. (see user guide for operation)
Note: See transmitter programming section on how to learn the transmitter to the second car.

Constant output

Note: Horn option (AUX-1) must disabled to enable "constant output feature".

1) Pressing and holding the button for more than 3 seconds will lock all doors and will send a negative pulse to the lock wire (Brown wire from 12-pin harness) as long as the button

is held down (maximum of 15 seconds). This negative pulse can be configured to activate certain functionalities such as rolling up the windows.

2) Pressing and holding the button for more than 3 seconds will unlock all doors and will send a negative pulse to the unlock wire (Green wire from the 12-pin harness) as long as the button is held down (maximum of 15 seconds). This negative pulse can be configured to activate certain functionalities such as rolling down the windows.

Diagnostics via parking lights

Diagnostic table for shutdown.

Parking lights flashes	Cause
1	• Runtime has expired.
2	• Shutdown by remote. • Ready mode is activated.
3	• Failed start.
4	• Brake shutdown.
10	• Hood shutdown.
Flash for 30sec	• Panic mode
Flash for 60sec	• Alarm triggered

Diagnostic table for start failure.

Parking lights flashes	Cause
1 (Manual transmission only)	• Ready mode is not activated. • Tach signal is not learned.
1 slow ➔ 2 quick	• The system is set to valet mode.
3 (Automatic transmission only)	• The parking brake is active. • Yellow loop is connected.
4	• Brake wire is active
6	• A tach signal is detected before Ignition.
10	• Hood wire is active.

Note: The installer can also use the PRG-1000 to diagnose shutdown and remote start failures. Refer to the PRG-1000 manual guide.

Parking lights flashes summary table

Parking lights flashes	Description
1	• Doors locked. • Trunk released. • Enable LED flashing via remote. • Start signal received from the remote.
2 slow	• Power OFF ➔ ON; transmission is set to automatic.
2 fast	• Doors unlocked • Valet mode is deactivated
3 slow	• Runtime is extended.
3 fast	• Valet mode activated. • Disable LED flashing via remote.
4 fast	• Power OFF ➔ ON; transmission is set to manual. • Enter multi speed tach programming • Enter time delay adjustment in virtual tach system.
5 fast	• Tach signal is learned successfully. • Transmitter is learned successfully.
8 fast	• The unit is reset.
ON ➔ twice	• Cold weather mode deactivated
ON ➔ 3 times	• Cold weather mode activated.
ON for 20sec	• Enter programming mode
Solid ON	• Engine is running under remote start.
Flash for 30sec	• Panic mode is triggered.
Flash for 60sec	• Alarm is triggered.
ON ➔ twice ➔ twice	• A remote start was attempted while the system is in home valet.

Resetting the module to default features

Resetting the module is not a required process. Most of the time, you can avoid resetting the module by fixing the issue directly at the root of the cause.

To reset the module:

1) Enter programming mode (page-17)
2) In 20 seconds or less, press and release the brake pedal 6 times.
3) The parking lights will flash 8 times, confirming the reset.

On some vehicles such as BMWs and certain Volkswagens, pressing the brake pedal without the key in the ignition ON position will not work. If this is the case, simply leave the ignition ON while performing the reset.

Troubleshooting Poor Transmitting Range

In order to ensure optimal range, the antenna should be installed at least 7.5 cm (3 in.) from the roof – 2.5 cm (one inch) below the tint strip is generally the best location. Install the antenna as far as possible from radio antennas, GPS, Onstar® or factory compasses.
Many factors may affect the operating range of the transmitter. Some of these are:

- The condition of the battery in the transmitter.
- The operating environment (for example: downtown radio-frequency noise, airports, cellular phone towers…)
- Metal: any type of metal will affect operating range. This includes the metal in the car.
- The shape of the vehicle can affect range as well; vans in general have an especially poor range.
- The shape of the roof and A-pillars brings about considerable radio-frequency deflection (in this case the signal from the remote control). As a result, the direction in which the vehicle is facing in relation to the remote control can affect the range. Straight on – standing in front of the vehicle – generally gives you the greatest range; the second best performance is from the back. Using the remote control from either side of the vehicle will usually give the lowest range.
- The range will be significantly lower in a crowded parking lot than in open space.
- Always hold the transmitter high, approximately at shoulder height. Holding the transmitter against your chin will also increase your range: your head acts as an antenna.
- The operating range will be somewhat lower on vehicles equipped with an aftermarket or factory alarm.
- Windows and windshields tinted with lead or metallic tints will decrease the operating range.
- The antenna cable may have been cut and/or is grounded out on the chassis. Try using another cable.
- The receiver may be faulty. Try replacing it with another.

Testing

Before putting the vehicle back together, it is recommended to check that the system operates properly. The following testing procedures should be used to verify proper installation and operation of the system. Before testing, make sure that all connections are soldered and that the unit is plugged in.

- ❑ If installed on a MANUAL transmission, make sure the system properly enters and exits ready mode (see earlier in this Guide).
- ❑ Remote-start the engine and listen for starter drag. If the starter cranks for too long, carry out another tach programming procedure.
- ❑ Hood switch shutdown. With the vehicle running under the remote car starter, open the hood; the vehicle should shut down. If it does not shut down, check the hood pin-switch and its connector.
- ❑ Brakes shutdown circuit. With the vehicle running under the remote car start, press and release the brake pedal. The engine should shut down immediately. If the engine continues to run, check the brakes switch connection.

Troubleshooting Q & A

The following are some common installation related issues.
A problem or symptom is given and then possible solutions and/or suggestions as to areas to verify are enumerated.

1. I cannot program the remote control.
- Do the parking lights come on when you open the hood? (Does the hood pin work?)
- Is the antenna plugged in?
- Does the light on the remote control turn on when you press the button?
- Is the Ignition wire connected properly?
- Are you waiting too long between programming steps?
  - After flashing the hood pin turn the key to ON, *wait* 2 seconds.
  - Turn the key OFF, ON, OFF then keep pressing the LOCK button repeatedly until you get 5 light flashes from the module.

    The entire process should take less than 20 seconds.

2. The car won't start by remote.
- Does the light on the remote light up when you press the button?
- Is the starter in valet mode?
- Does the vehicle have passive antitheft security (PATS, VATS, PASSLOCK, TRANSPONDER)?

3. The starter motor cranks for 8 seconds but the car won't start.
- Are you on the correct ignition wire?
- Does the car have more then 1 ignition?

4. The car cranks briefly then quits.
- Have you bypassed the passive security (PASSLOCK, PASSKEY III, PATS...)?
- Have you adjusted tach?
- Is the vehicle's battery weak?

5. The park lights come on for 8 seconds but the starter motor will not crank.
- Does the car have an after market starter disable?
- Have you bypassed the VATS or Passlock II?
- Is the start wire hooked up correctly?
- Has the clutch been bypassed properly (for standard transmissions)?

6. The car starts but starter stays engaged.
- Make sure ignition and crank are not common with the key out (connected at rest). May have to add relay (i.e. Tercel, Altima)
- Did you make an auto tach adjustment?
- Weak tach signal?
- Bad ground?

7. The car starts by remote but then the starter re-engages.
- Check ground wire
- Is tach programmed?

8. The car starts on its own.
- Is the module in cold weather mode?
- Program remote 4 times. (another remote may be programmed to your module)
- Is external trigger shorting out to ground?

9. The factory alarm goes off when I start by remote.
- Did you hook the disarm wire?
- Do you have the correct OEM disarm wire?

10. The ABS and the CHECK ENGINE light come on in the dash.
- Are you missing a second ignition or accessory?

11. The car starts and runs but the heater blower motor doesn't work.
- Incorrect accessory wire

- Does it have more then one accessory?

12. The car starts, the heater works but not the air conditioning system.
- Missing second accessory (common on some Fords)

13. The CHECK ENGINE light comes on and the vehicle doesn't shift, it feels sluggish.
- Missing second ignition. (common on some GMs)

14. On cold mornings the park lights come on, go out, and then flash 2 times slowly.
- Check for a weak car battery. (Try using the cold weather mode option)

15. The car doesn't start and the park lights flash 4 times.
- Check brake circuit.
- Check for blown rear park light (feedback).

16. The vehicle runs for 8 seconds then shuts down. I have 12 volts on starter wire the whole time but no over crank.
- Did you make an auto tach adjustment? (New GM trucks, cars and minivans)

17. The car runs for about 5 seconds, shuts down and restarts; it does this 3 times.
- Check voltage on tach wire.
- Try an alternate tach source.

18. The car starts by remote but the range is poor.
- Are the car windows tinted?
- Does it have an after market alarm?
- Is the antenna mounted below the tint strip?
- Using the correct remote?
- Change remote battery.
- Heated front windshield? (Taurus, Crown Victoria)
- Metal film in windshield?
  (GM minivans)

19. I get excellent range when the vehicle is not running but almost none when it is running.
- Check for loose spark plug boot or faulty ignition wires, cracked cap.
- Try disconnecting blower motor.

20. After about a half hour almost no range at all until the vehicle is started with the key again.
- Does the vehicle have factory alarm/ keyless entry?
- You might have to switch to a 433MHZ module (some GM Trucks, Cavalier/Sunfire, Breeze/Stratus/Cirrus).

21. The radio stays on after the vehicle shuts down.
- Retained Accessory Power will keep power to radio for approx. 10 - 15 minutes or until it sees a door open. (Fords, GM's R.A.P.)

22. The headlights stay on after car shuts down by remote.
- Switch headlight switch from auto to normal. (Toyota)
- On some vehicles, opening a door will shut the head lights off. Pulse the drivers door pin with the rearm wire.

23. I get no 12V reading at all at the brake pedal, depressed or not.
- Some vehicles require ignition be on. (BMW)

24. The park lights flash on their own.
- Check hood pin adjustment.
- Bad ground?

25. I blow fuses every time I try the remote door locks and I have already installed a relay.
- Door locks are reverse polarity, and not positive trigger.

26. I blow fuses every time I try the remote trunk release and I have already installed a relay.
- Trunk3 release is reverse polarity, and not positive trigger.